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# Nutrition Knowledge of Pre-medical Students

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*Jennifer M. Newcome<sup>\*</sup> and Cynthia K. Moore<sup>†</sup>*

## **ABSTRACT**

Nutrition knowledge has been shown to be increasingly critical in physician practice. Therefore, education has also become very critical. Medical schools have been working over the last few decades to include nutrition education in their curriculum, but due to many barriers, it is difficult to fulfil requirements. It is the purpose of this descriptive study to determine the nutrition knowledge of pre-medical students at the University of Arkansas and conclude if a nutrition class for these students would be beneficial. The average score of the nutrition knowledge assessment was  $11.2 \pm 3.04$  out of a possible 23. Because the literature provides reason for improving medical nutrition education and it has been difficult to include that education in medical school, it may be beneficial to improve undergraduate pre-medical nutrition education.

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<sup>†</sup> Cynthia Moore is a Clinical Assistant Professor in the School of Human Environmental Sciences and a faculty mentor.

## **MEET THE STUDENT-AUTHOR**



*Jennifer Newcome*

I am from Branson, Missouri and graduated from Branson High School in 2008. After spending my freshman year as a pre-medical biology major, I decided that I wanted something different. I kept the pre-medical track and switched to dietetics. Throughout my undergraduate career, I have had the opportunity to be involved with many things, from recreation to student government. Most significantly, I co-founded and was treasurer of the Razorback Quidditch team, which competes in the Harry Potter-based sport against other universities around the country. In the summer of 2011, I had the opportunity to do an internship in a hospital in Viña del Mar, Chile. Along with improving my Spanish, I played with children with disabilities and helped people stretch who were bedridden. This previous year, after I finished defending my thesis, I presented my research at a poster session for the Arkansas Dietetic Association in Little Rock at the annual state meeting.

This fall I will be attending the University of Arkansas for Medical Sciences College of Medicine. I would like to thank all my professors for making this all possible, with special thanks to Cynthia Moore for her guidance.

## **INTRODUCTION**

The purpose of this descriptive study was to assess the amount of nutrition knowledge of pre-medical students and to identify any significant relationships between demographic characteristics and nutrition knowledge. It was hypothesized that pre-medical students did not have sufficient nutrition knowledge.

Physicians must be able to treat a plethora of conditions which are affected greatly by diet. In a 1997 study, it was reported that approximately 16% of episodes of illness with which doctors are presented require nutrition counseling, including many chronic diseases (van Weel, 1997). Intervention is crucial, because it makes a difference in patient outcomes. Patients who are advised by their doctor to lose weight are three times more likely to attempt weight loss than those who are not advised (Galuska et al., 1999). Over 75% of the respondents in one study reported that physicians are important in the nutrition education of their patients (Levine et al., 1993). However, despite the recognized significance of the issue, less than half of primary care doctors discuss weight loss with obese patients (Kushner, 2003; Galuska et al., 1999).

In addition, nutrition knowledge is deficient. In one study, 48% of responding physicians reported the inability to adequately counsel patients on common obesity treatment options (Jay et al., 2008). Furthermore, in a survey of Internal Medicine and Cardiology physicians, it was shown

that there was a general lack of knowledge about lipids in the diet (Truswell et al., 2003; Flynn et al., 2003). A survey of residents resulted in an average score of 66% on a nutrition knowledge test. Some of the areas that needed significant improvement were obesity, endocrine disorders, and cardiovascular nutrition (Vetter et al., 2008).

In 1985, the National Research Council began the nutrition education reformation in medical schools and determined that what medical students learned about nutrition was inadequate and needed to be changed (Committee on Nutrition in Medical Education, Food and Nutrition Board, Commission on Life Sciences, National Research Council, 1985). Congress also issued a call to action on the subject in 1990, and other prominent organizations have added their voices to the call for more nutrition education (Krebs, 2006).

Despite efforts to improve nutrition education in medical schools, knowledge continues to be below the desired levels. It was documented that, on average, students in U.S. medical schools received 23.9 hours of nutrition education, when the required amount was 25 hours (Adams et al., 2006). A 2006 study showed that 40 of 106 medical schools met the national requirements (Adams et al., 2006) while a 2010 study showed that only 28 of 105 schools met requirements (Adams et al., 2010).

Throughout most of the literature, the common barrier to nutrition education is time (Kolasa and Rickett, 2010). Residents identified lack of time as detrimental to includ-

ing nutrition education in patient care (Lazarus, 1997). Along with time, the sheer volume of material that must be incorporated into medical training is a problem. There has been an effort to decrease the amount of material covered in medical school in order to increase knowledge retention (Deen et al., 2003; Lo, 2000; Ball et al., 2010). Some researchers suggested that more instruction during clinical clerkships and residencies would resolve this problem (Vetter et al., 2008). However, Adams argues that early nutrition education is imperative (Adams et al., 2006).

The focus of medical education has also been recognized as a barrier to the inclusion of nutrition education in medical school. The traditional emphasis of medical training has been on diagnosing and treating disease rather than on preventative medicine (Intersociety Professional Nutrition Education Consortium, 1998). Nutrition is frequently taught as a component of biochemistry in medical school, which forces a disconnect of nutrition with food and diet (Truswell, 1998). Sometimes, nutrition is not even considered clinically relevant (Touger-Decker, 2004).

Support is another area that can be improved. For example, preceptors expected medical students to counsel patients on nutrition, but were unable to provide feedback or suggest strategies (Wong et al., 2004). The lack of staff with expertise was the third most common barrier in medical school programs (Deen et al., 2003). Harvard medical school identified that encouraging faculty, department chairs, and deans to include nutrition in the curricula and retaining nutrition experts on staff were areas that needed improvement in medical schools (Lo, 2000). Registered Dietitians have been demonstrated to be high-quality nutrition instructors for medical students, but there are few in that position (Touger-Decker, 2004). Therefore, training in nutrition is imperative for physicians, but it is difficult to include in medical school. Undergraduate education can be a beneficial time to introduce that training. It is the purpose of this study to determine the need for nutrition education at that point in the students' training.

## **MATERIALS AND METHODS**

Nutrition knowledge was measured using a previously validated survey based on the Dietary Guidelines for Americans (Moore, 2006). The instrument contained twenty-three multiple choice knowledge items, with some added demographic questions, such as age, gender, ethnicity, and major in addition to pre-medical. Institutional Review Board approval was granted at the University of Arkansas.

The survey was posted on the website Survey Monkey, a free online survey distribution tool. The link was sent with an explanation of the study to the Alpha Epsilon Delta email listserv by the current student president. Alpha Ep-

silon Delta is the pre-medical honor society and includes every student that is officially on the pre-medical track at the University of Arkansas. One request was sent via email to complete the survey and the response period was six days.

The results were downloaded in a Microsoft Excel file and analyzed with PASW Statistics 18 (SPSS Inc, Chicago, Ill.). A mean knowledge score was calculated and a series of frequencies and *t*-tests were conducted.

## **RESULTS AND DISCUSSION**

The survey link was emailed to approximately 400 students. Thirty eight completed the survey, resulting in a response rate of 9.5%. The mean age was 20 years, with a range of 18 to 30 years. The sample included 27 females (71%) and 11 males (29%). Thirty three participants identified themselves as "white, non-Hispanic" (87%), with the rest categorized as "other" (13%). There was one pre-medical dietetics major (3%) in the sample. The other 37 subjects were primarily biology majors. Three subjects had taken at least one nutrition course in college and three other students had followed a special diet for medical reasons. There were no significant differences in knowledge score based on age ( $P = 0.101$ ), gender ( $P = 0.373$ ), ethnicity ( $P = 0.637$ ), whether a nutrition course was taken ( $P = 0.098$ ), or whether a special diet was followed ( $P = 0.395$ ). There was a significantly higher knowledge score by major (dietetics) ( $P = 0.022$ ). However, sample size was  $n = 1$ . A perfect score on the knowledge instrument was 23. The mean knowledge score in this sample was  $11.2 \pm 3.04$  (49%) with a range of 4 to 18. Figure 1 is a histogram of the overall scores. It should be noted that the distribution of responses does not follow a normal distribution, and that the most frequent score was 9.

The 23 knowledge items were analyzed for frequencies of correct and incorrect answers. Two knowledge items that had the lowest frequency of correct responses addressed the characteristics of a conventional diet, which was defined in the survey instructions as a diet that conforms to the Dietary Guidelines for Americans. In the first question, 52.6% of respondents answered that a conventional diet "focuses only on foods eaten and not behavior changes," while only 13.2% answered correctly that a conventional diet "is based on a large amount of scientific research." In the second question, 73.7% of respondents answered that conventional diets "lack key nutrients" and only 13.2% answered correctly that conventional diets "are not boring to follow long term." This shows that the students were not familiar with the Dietary Guidelines for Americans.

Subjects were asked where they get most of their nutrition information and were allowed to select all applicable choices from a list of 13 that included the choice, "other."

The majority of respondents indicated that they received most of their nutrition information from family (86.7%) (Fig. 2). The next prominent source was the internet (56%) followed by friends (42.1%). Doctors, dietitians and nurses were not popular sources for nutrition information.

Despite the need to educate physicians and medical students about nutrition, there is concern about the lack of time in medical school for nutrition education. Two of the most prominent barriers to implementing nutrition training were the lack of time and the amount of material, which have caused researchers to suggest including medical nutrition education outside of medical school (Vetter et al., 2008). This either could be done before or after. Since resident nutrition education has been lacking, the solution either could be to improve that area or include nutrition education in undergraduate pre-medical education.

The results of this study support the body of literature which suggests the need for nutrition education in the preparation of physicians. This need for nutrition education has been demonstrated in the literature and has been acknowledged in opinions of students and physicians (Krebs, 2006; Committee on Nutrition in Medical Education, Food and Nutrition Board, Commission on Life Sciences, National Research Council, 1985; Truswell et al., 2003). This study and the current body of research on the nutrition knowledge of current physicians and medical students support the need to recommend nutrition coursework in the education of pre-medical students.

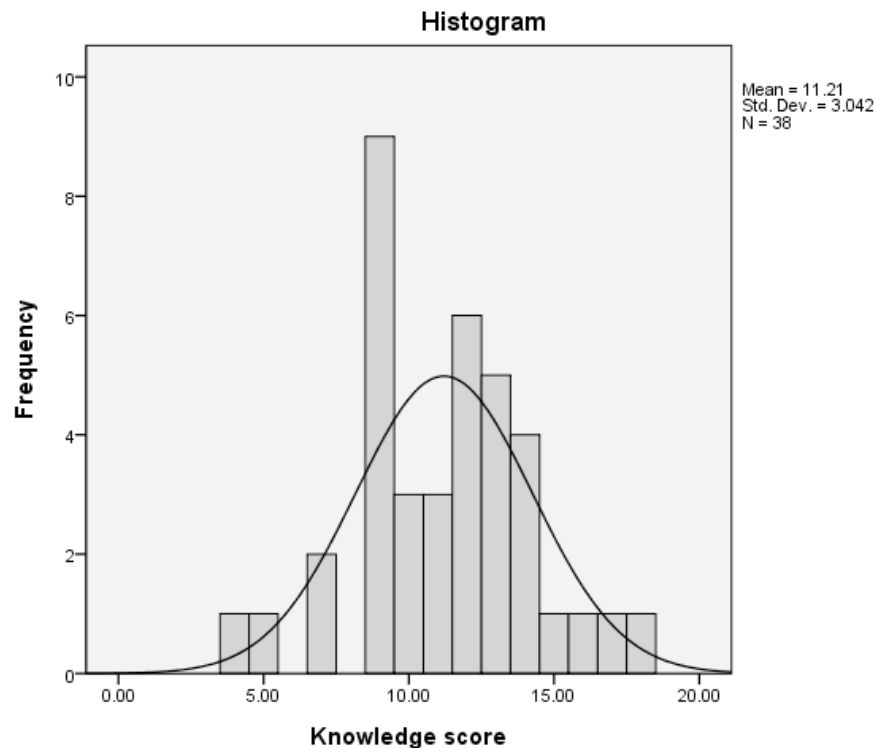
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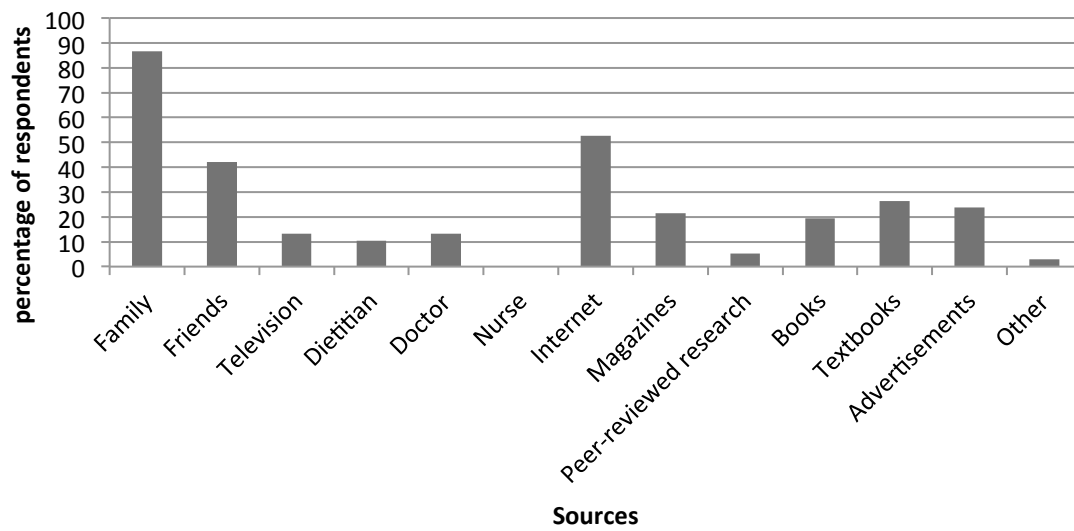
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**Fig. 1.** Distribution of scores on the nutrition knowledge assessment.



**Fig. 2.** Percent of respondents that reported using the above sources for nutrition information. The subjects could choose however many options they desired.